

What is claimed is:

1. A filter device comprising:

a hollow fiber membrane module structured with a multiplicity of hollow fiber membranes bundled at one ends and made free at other ends, and arranged for spread into a broom form within fluid; and

injection means for ejecting the fluid or gas from a radial central position toward a radial outward of said hollow fiber membrane module to apply an agitation thereto.

2. A filter device comprising:

a filter cylinder to be arranged in a certain direction;

a hollow fiber membrane module structured with a multiplicity of hollow fiber membranes bundled at one ends and made free at other ends, and arranged for spread into a broom form within said filter cylinder; and

raw fluidinjection means for ejecting raw fluid a fluid or gas from a radial central position toward a radial outward of said hollow fiber membrane module thereby injecting raw fluidsaid fluid or gas to an interior of said filter cylinder.

3. A filter device according to claim 2, wherein said filter cylinder is arranged vertical in an axial direction.

5 4. A filter device comprising:

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a hollow fiber membrane module structured with a multiplicity of hollow fiber membranes bundled at one ends and made free at other ends, and arranged for spread into a broom form within fluid;

10 injection means for ejecting the fluid or gas from a radial central position toward a radial outward of said hollow fiber membrane module to apply an agitation thereto; and

15 a funnel member, disposed below said hollow fiber membrane module, made in a form narrowed in opening area in a downward direction.

5. A filter device comprising:

20 a filter cylinder to be arranged in a certain direction;

a funnel member made in a form narrowed in opening area in a downward direction and arranged within said filter cylinder, to define an interior of said filter cylinder with a filter chamber on an upper side and a  
25 recovery chamber on a lower side;

a hollow fiber membrane module structured with a multiplicity of hollow fiber membranes bundled at one ends and made free at the other ends, and arranged for spread into a broom form within said filter cylinder; and

5 raw fluidinjection means for ejecting raw fluidfluid or gas from a radial central position toward a radial outward of said hollow fiber membrane module thereby injecting the raw fluidsaid fluid or gas to an interior of said filter cylinder.

10 6. A filter device according to claim 5, wherein said filter cylinder is arranged vertical in an axial direction.

15 7. A filter device comprising:

a filter cylinder to be arranged vertical in an axial direction;

20 a funnel member made in a form narrowed in opening area in a downward direction and arranged within said filter cylinder, to define an interior of said filter cylinder with a filter chamber on an upper side and a recovery chamber on a lower side;

a hollow fiber membrane module structured with a multiplicity of hollow fiber membranes bundled at upper

ends and made free at lower ends, and arranged for spread into a broom form within said filter cylinder;

raw fluidinjection means for ejecting raw fluidfluid or gas from a radial central position toward a radial outward of said hollow fiber membrane module thereby injecting the raw fluidfluid or gas to an interior of said filter cylinder; and

627 a backwash camber formed on a top surface of said filter cylinder, to temporarily store filtrate fluid permeated through said hollow fiber membrane module and have a fluid pressure to be applied during backwashing.

8. A filter device according to any one of claims 2, 5, and 7, wherein said filter cylinder has an inner diameter of 1.5 to 3.0 times bundled end diameter of said hollow fiber membrane module.

9. A filter device according to any one of claims 2, 5, and 7, wherein said raw fluidinjection means is structured with an injection pipe penetrating a bottom surface of said filter cylinder and inserted through a lower end opening of said funnel member to structure an upper part inserted in a central position of said hollow fiber membrane module and ejection ports formed in said

injection pipe at a part inserted in said hollow fiber membrane module.

5 10. A filter device according to claim 9, wherein said ejection ports are arranged between a one-third position from the upper end and a two-third position from the upper end with respect to a longitudinal direction of said hollow fiber membrane module.

10 11. A filter device according to any one of claims 1, 2, 4, 5, and 7, wherein said raw fluidinjection means injects raw fluidfluid and bubbling air.